

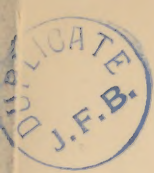
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## COMBINATION AND THERAPEUTIC ACTION OF SOME FILLING-MATERIALS.

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Who has not mentally asked the question, as he has taxed himself and his patient to almost complete exhaustion in some dental operation of unusual magnitude or length, Is there not some way either to prevent this destruction of tissue or to restore these organs when attacked, unattended by the severe mental and physical strain upon the operator, and the shrinking, dread, and suffering to the patient which the present general practice and teaching involves?

Is the popular impression true that generation after generation the teeth of civilization are degenerating, and their power of resisting decay lessening? and shall dentistry still persist in averting the evil by the use of one remedy, mechanically applied, in all cases and in all conditions?

Is there no consolation other than this that the profession can offer to the tens of thousands who have never shared its blessings, and to many others suffering abuse from burring-engines, dental mallets, rubber dams, and other appliances, who are in doubt if it confers a blessing or a curse?

Has not the present aspect of dentistry a near parallel in the practice of general medicine of a few years ago, when calomel was of almost universal application? Every age, temperament, and condition felt its power for good or evil. Whatever the trouble, cerebral, thoracic, or abdominal, local or general, calomel as a remedy had its advocates. A generous and earnest spirit in medical science, aiming to relieve suffering and prolong human life, searching for cause and observing effect, broke the bounds of established usage and teaching; tried other means and remedies, until now, with the truly educated, mercury in any and all its forms is but an adjunct in general practice.

Medicine is not so narrow as to withhold its hands from remedies of merit, because, forsooth, they are not hoary with age and use.

Do not the broken arches and the edentulous mouths, continually presenting, plainly testify that dentistry as now taught and practiced is unable to cope with the diseased conditions of human teeth?

If the profession would avert this evil, observation must be more extended and accurate; new remedies must be sought and applied, investigation by experiment made popular, and the employment of other than mere mechanical remedies encouraged.

The deductions from the teaching of all our text-books, from periodicals and society discussions, point to the use of one filling-material only in a given cavity—and that efficient in proportion as it is mechanically manipulated—for the treatment of all carious conditions and for the restoration of teeth.

If gold is recommended, the inference, if not the positive teaching, is that the filling, to be honestly and efficiently made, must be *all* of gold; if tin is the material, the cavity must be filled entirely with tin; and so also of amalgams, gutta-percha, and oxychloride of zinc. The exception to this is in some more recent and advanced teachings on the use of gutta-percha, tin, lacto-phosphate and the oxychloride cements as coverings for exposed pulps; and different materials for use in roots, whatever may be adopted to complete the filling. It is not too much to say that any consideration or discussion of other filling-materials than gold, of their composition or methods of use, of their behavior in varied conditions of the oral cavity, or of their distinctive properties, has been evaded or frowned upon as too elementary and unimportant to engage the attention of writers or speakers. The desire to be known only as a "first-class operator" has held timid ones chained almost exclusively to the mechanical use of one material, and caused the loss to dental science of many an otherwise earnest investigator.

To inquire if some two or more of the present filling-materials cannot be conjointly used in the same cavity for better preservation and greater comfort to the tooth; also to inquire if there may not be some hitherto unsuspected therapeutic action in dental oxychloride of zinc preparations, are the special objects of this paper.

That fillings fail because of lack of adaptation to the walls of cavities is a fact generally believed and admitted, and that gold is the most difficult material to *perfectly* adapt in many cases is also known and admitted. That the oxychloride of zinc cements are among the best, if not *the best*, preservatives in cavities of decay is a truth which will become as fully admitted when it is as well understood. If decay has ever been known to commence anew under an oxychloride of zinc filling when in place, the attention of the writer has never been called to the fact.

Chloride of zinc locally applied is recognized as among the most

efficient agents known for promoting healthy granulations, as "in addition to its escharotic properties it appears to exercise a greater influence over the vital action of neighboring parts" than most other caustics; the separation of its eschar leaving healthy and vigorous granulations. It is equally efficient as an antiseptic and a disinfectant. As an application to chronically inflamed and suppurating gums at the festooned margins, after the removal of tartar, it probably has no equal. This liquid, meeting so fully the indications for an antiseptic and a stimulant to the production of healthy tissue in a cavity of decay, mixed with the various preparations of oxide of zinc, forms a close and seemingly impervious union with the walls of cavities.

There are good reasons for the belief that these cements when properly manipulated not only exclude moisture, but that they do for diseased dental tissue what chloride of zinc does for more vascular tissue, viz., *stimulate the production of healthy structure* in the parts with which they are brought in immediate contact and in the near surroundings.

Illustration: Ten years ago a cavity of decay was filled in a left superior sixth-year molar with oxychloride of zinc and gold. The decay was deep-seated and involved the whole mesial face of the tooth. A portion of softened dentine was left covering the almost exposed pulp, and the oxychloride placed directly upon it. Enough of this cement was cut away to allow for the introduction of a gold filling, to protect the walls of the cavity and the oxychloride. The tooth was of a character to decay readily and rapidly, but the only object had in view in filling the cavity in the manner described was the better protection of the pulp, by interposing a non-conductor between it and the gold. Something more than six years after, it was deemed advisable to remove this filling for the purpose of gaining access to a small cavity in the distal face of the second bicuspid, which had been forced backward by occlusion until it rested in the concavity of the finished surface of the gold filling. The conditions were such that the removal of this filling permitted access to the cavity in the bicuspid without cutting or wedging, hence the adoption of the plan. Other fillings made entirely of gold and introduced about the same time in other teeth in this mouth had failed, and had been replaced in the mean time.

The dentine under the gold and oxychloride in question had undergone a decided transformation, changing from soft to hard and dense structure, seemingly capable of resisting decay without further protection. This exhibition of the beneficial action (as it seemed) of the oxychloride of zinc made a profound impression. And as its cautious use in all classes of cavities from that time to the present has given correspondingly good results, the most favorable conclusions have

been formed for the practice of *lining* all cavities with an oxychloride cement, whatever the external filling is to be.

In many cases time can be saved in filling, the certainty of the operation increased, and the tooth rendered more comfortable to the patient; and further, thousands of pulps which under the all-gold system must be sacrificed or capped but to die under the filling, can by this method be comfortably and permanently saved.

The antiseptic and stimulating action of the chloride of zinc is of a most beneficial character, inducing in many cases better organization of the tissues in the living parts to which it is applied.

The manipulations in their simplest form consist in excavating a given cavity in the usual way and then filling entirely with some one of the best oxychloride of zinc cements,—under the rubber dam if practicable. Having been allowed to set and harden for a few minutes enough of the cement is cut away or excavated to form a cavity for securely introducing a gold surface filling. By this means the cavity can be nearly filled, or merely lined with the cement, and *it* kept from disintegration by a filling of gold. The color of the dentine is thus preserved, the pulp isolated from thermal shocks, and the preservation of the tooth more certainly secured.

In ordinary crown cavities, and in many cases of deep-seated caries in approximate cavities, this manner of procedure simplifies and shortens the operation of filling, but in small or shallow cavities complicates it. The cavity may be of such a nature as to render the conjunction impracticable. When such cases occur, the cavity can be filled entirely with gold, tin, or any other filling material in the usual way. In deep-seated crown and other cavities where under-cuts exist, if the enamel is strong, it need not be cut away, for when the decay is removed and the cement carefully and securely packed in its place, it forms a support when hard equivalent to true dentine. A cavity cut in it to a depth a little greater than the thickness of the enamel reduces the final filling with gold to an operation of the simplest character, as this new cavity has a hard, firm base of cement, and a boundary of cement and tooth-material, or of the latter alone.

It may well be inquired if there are not some objections to the use of the oxychloride cements in the manner proposed. There is one objection, and it is believed to be the only one worthy of mention. It causes pain in the tooth immediately on application, varying in degree and duration with the extent of the decay and the character of the tooth. The sharpest and most prolonged pain is usually experienced in young or soft teeth, and its duration is from three to fifteen, and rarely to thirty, or even sixty minutes. The pain is greatly lessened or entirely obviated by dextrous and intelligent manipulation, which will follow a study of its peculiarities and its

continued use.\* Its extensive application for the past two years in all classes of teeth and cavities, as a covering for recently-exposed pulps and in hyperesthetic conditions of the dentine, has failed to develop an uncontrollable or even a markedly obstinate case of odontalgia.

Exposed pulps may be first protected with lacto-phosphate and a Weston cap, with an oxide of zinc *pad*, with gutta-percha, or in any manner which seems most desirable, and the cement placed over the capping used. The oxide of zinc pad is made by mixing the powder of any oxychloride cement with creasote or oil of cloves, using but a very small quantity of either liquid. By patting this mixture with a spatula it can be worked into a mass aptly termed a *pad*. This can be used as a covering applied directly to the pulp, or to prevent pain in deep-seated caries. It is unquestionable that the therapeutic action of the oxychloride is much diminished, if not completely arrested, by a covering of gutta-percha over the pulp, while the oxide of zinc pad modifies but does not prevent its action, and for this reason it is esteemed, and has proved in practice a better and safer capping for pulps than gutta-percha.

That the action of the chloride of zinc is not wholly interrupted by the *pad* is evident in the fact that the powder of which the pad is made becomes in a short time consolidated and almost homogeneous with the oxychloride of zinc used to cover it.

To recapitulate, we find the advantages of the oxychlorides as linings or as basal fillings, to consist in the saving of time; perfect apposition of filling-material with the walls of the cavities; solid base and actual support to frail walls; secure anchorage for metallic fillings; ready adaptation in places difficult or impossible of access with gold; no discoloration of the material itself, and a preventive of discoloration in dentine; comfort, especially to highly-organized teeth; a stimulant to the production of healthy tissue, and the most effectual preservative known in dentistry.

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\* It has been urged that the chemical combination which is the result of bringing together oxide and chloride of zinc destroys the therapeutic effect of the latter, but the fallacy of such reasoning is shown by the facts here stated; and further, an application of oxychloride of zinc carelessly or injudiciously made produces pain undistinguishable in character from that of an application of chloride of zinc in the same place.









